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EXAMINER

NGUYEN, DILINH P

ART UNIT

PAPER NUMBER

2814

DATE MAILED: 08/28/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/964,009

Applicant(s)

DEGANI ET AL.

Examiner

DiLinh Nguyen

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133)
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 20 June 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-21 is/are pending in the application.
- 4a) Of the above claim(s) 2-9 and 13-18 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1, 10-12 and 19-21 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.  
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).  
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_ 6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Election/Restrictions***

Applicant's election with traverse of Embodiment 1: fig. 3, in paper No. 3 is acknowledged. The traversal is on the ground (s) that all pending claims of the application read on this embodiment.

This application contains claims directed to the following patentably distinct species of the claimed invention:

Embodiment 1: fig. 3.

Embodiment 2: fig. 4.

Embodiment 3: figs. 6-7.

Embodiment 4: fig. 8.

Embodiment 5: fig. 9-11.

Only claims 1, 10-12 and 19-21 read on the elected embodiment.

### ***Specification***

The disclosure is objected to because of the following informalities:

Regarding claim 21, the phrase: "...a first ground connection to the digital MCM, a second ground connection to the RF MCM, the first and second ground connections being electrically isolated..." is not described in the specification.

### ***Drawings***

The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the first ground connection to the digital MCM, the second ground connection to the RF MCM, the first

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and second ground connections being electrically isolated must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

***Claim Rejections - 35 USC § 112***

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claim 21 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The phrase: "...a first ground connection to the digital MCM, a second ground connection to the RF MCM, the first and second ground connections being electrically isolated..." is not understood.

Where are the first ground and the second ground connections and how they are electrically isolated?

The digital MCM and the RF MCM are all electrically connected. Therefore, the ground of the RF MCM is also the ground of the digital MCM because they are electrically connected. The limitation "the first and second ground connections being electrically isolated" is not understood.

***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claim 1 is rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant Admitted Prior Art (fig. 5) in view of Hultmark et al. (U.S. Pat. 6232667).

Applicant Admitted Prior Art (fig. 5) discloses a semiconductor device comprising: a substrate, a digital MCM and a RF MCM.

Applicant Admitted Prior Art (fig. 5) fails to disclose the digital MCM and the RF MCM all electrically interconnected one on top of another.

Hultmark et al. disclose a semiconductor device (fig. 2B) comprising: a plurality of chips 30 and 43 all electrically interconnected one on top of another (fig. 2B, column 7, lines 48-50) to provide a stacked integrated circuit chip assembly. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the device of Applicant Admitted Prior Art (fig. 5) to provide a stacked integrated circuit chip assembly, as shown by Hultmark et al.

5. Claims 10-12 and 19-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant Admitted Prior Art (fig. 5) in view of Akram et al. (U.S. Pat. 5994166) and further in view of Vendramin (U. S. Pat. 5955789).

- Regarding claims 10-11 and 19, Applicant Admitted Prior Art (fig. 5) discloses a semiconductor device comprising:
  - a system substrate 73;
  - a RF MCM on a RF MCM substrate 81;
  - a digital MCM on a digital MCM substrate 76;

the first solder bump array connecting the RF MCM substrate to the system substrate, and wherein at least one of the first solder bump array is an RF solder bump conductor;

the second solder bump array. However, the AAPA fails to disclose the second solder bump array connecting the digital MCM substrate to the RF MCM substrate.

Akram et al. disclose a semiconductor device comprising: the first solder bumps array 126 connecting the first stacked substrate 116 to the system substrate 102; and the second solder bumps array 148 connecting the second stacked substrate 140 to the substrate 116 (cover fig., column 6, lines 5 et seq.) to achieve dense packaging (abstract). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the device of AAPA to achieve dense packaging, as shown by Akram et al.

Applicant Admitted Prior Art (fig. 5) and Akram et al. fail to disclose a Faraday cage around the RF solder bump conductor.

Vendramin discloses a semiconductor device comprising: a plurality of ground solder balls 303 arranged around the signals connections solder balls 305 to form a Faraday cage to protect the active element from external HF wave interferences (abstract). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the device of AAPA (fig. 5) and Akram et al. to protect the active element from external HF wave interferences, as shown by Vendramin.

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- Regarding claims 12 and 20, Vendramin discloses the common ground is the ground of the active device.

***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to DiLinh Nguyen whose telephone number is (703) 305-6983. The examiner can normally be reached on 8:00AM - 6:00PM (M-F).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, OLIK CHAUDHURI can be reached on (703) 306-2794. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-7722 for regular communications and (703) 308-7724 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

DLN  
August 23, 2002



PHAT X. CAO  
PRIMARY EXAMINER